

WHAT IS CLAIMED IS:

1.       A multi-function air data sensor probe for sensing a plurality of air data parameters comprising a strut that extends from the skin of an aircraft, a pitot pressure sensing port at an outer end of said strut, a total air temperature sensor in said strut, at least one static pressure sensing port on said strut, and a rotatably mounted angle of attack sensing vane mounted on the strut for rotation about an axis generally perpendicular to the skin of the aircraft on which the strut is mounted, and extending outwardly from an outer end of said strut, the vane moving about the axis to indicate relative air flow direction past the strut.
  
2.       The multi-function air data sensor of claim 1, wherein said static pressure sensing port is positioned on a lateral side of the strut, and is in fluid communication with a passageway on the interior of the strut, a pressure sensor in fluid communication with the passageway for measuring the pressure in the passageway.
  
3.       The multi-function air data sensor of claim 1, wherein the strut has a base end for mounting on an aircraft, and a self-contained instrumentation package mounted at the base end for installation as a unit with the strut onto an aircraft with the instrument package on an interior of such aircraft.

4. The multi-function air data sensor of claim 1, wherein the strut has a base end that mounts on the skin of an aircraft, the sensing vane being mounted on a shaft supported on the strut with the shaft rotation about the axis, and an angle resolver connected to the shaft for determining changes in angle of the shaft as air flow past the strut changes the relative position of the sensing vane.

5. The air data sensor of claim 1, wherein the strut has a flow duct, the total air temperature sensor being mounted to be in fluid communication with the flow duct, an inlet to the flow duct comprising a forwardly facing air scoop, a wall surface defining portions of the scoop and flow duct and over which the air flows, and a plurality of openings in the wall surface to remove boundary layer air as the flow passes into the flow duct.

6. The multi-function air data sensor of claim 1, wherein said strut has a generally airfoil shape cross-section.

7. The multi-function air data sensor of claim 1, further comprising heaters mounted in the strut along at least a leading edge thereof that faces an upstream direction relative to the airflow.

8. The multi-function air data sensor of claim 1, wherein the strut has upper and lower lateral sides, the at least one static sensing port comprising a first static pressure sensing port on the upper lateral side of the struts, and a second static sensing port on the lower lateral side of the strut, and a separate pressure sensor coupled to the respective first and second static sensing ports.

9. A multi-function air data sensing probe comprising a strut having a base end mountable to an aircraft to extend laterally outwardly therefrom, an angle of attack sensor vane mounted on said strut and positioned at an outer end thereof and extending outwardly therefrom, said vane being pivotable about an axis generally perpendicular to a surface of an aircraft on which the strut is mounted, a sensor to sense an angular position of the vane relative to a reference, an outer end of the said strut having a pitot port facing upstream relative to air flow past the strut, a forwardly facing total temperature sensor inlet scoop formed on the strut, and spaced from the pitot port, said scoop leading to a flow passageway that changes direction to direct flow into a first chamber, a total air temperature sensor in said first chamber, said first chamber having exhaust openings therefrom for permitting air to flow through said chamber, separate static pressure ports on each of the lateral sides of the said strut, and pressure

sensors connected to separately sense pressures at the pitot port and the static pressure ports.

10. The multi-function air data sensing probe of claim 9, wherein said inlet scoop directs flow over a surface of a wall having a plurality of openings therethrough for bleeding boundary layer air through the openings to remove said boundary layer air prior to the flow entering the first chamber.

11. The multi-function air data sensing probe of claim 10, wherein said openings in said wall lead to a cross channel exhausting boundary layer air laterally of the strut.

12. The multi-function air data sensing probe of claim 9, wherein said pitot port is at an end of a tube, said tube being mounted on an outer end of said strut and extending upstream beyond the inlet scoop for the total temperature sensor.

13. The multi-function air data sensing probe of claim 9, wherein said strut has a generally airfoil shape cross section.

14. The multi-function of air data sensing probe of claim 9, wherein the static pressure sensing ports extend to separate static pressure passageways, and further comprising a separate pressure sensor for

sensing the pressure from each of the static pressure sensing ports and providing separate pressure signals, the pressure signals being provided to a processor for calculating angle of attack based upon differential pressures sensed at the static pressure sensing ports.

15. The multi-function air data sensing probe of claim 9, further comprising a processor including lookup tables for compensation of measured angle of attack, pitot pressure, and static pressure to provide corrected angle of attack and pressure signals.

16. The multi-function air data sensing probe of claim 15, wherein the processor is mounted in an instrument housing directly to a mounting plate for the probe.